What is claimed is:

1. A varactor comprising:

a substrate;

a first conductor positioned on a surface of the substrate;

a second conductor positioned on the surface of the substrate forming a gap between the first and second conductors;

a tunable dielectric material positioned on the surface of the substrate and within the gap, said tunable dielectric material having a top surface, at least a portion of said top surface being positioned above the gap opposite the surface of the substrate; and

a first portion of the second conductor extending along at least a portion of the top surface of the tunable dielectric material.

2. The varactor of claim 1, wherein:

a portion of the tunable dielectric material lies along a surface of the first conductor opposite the surface of the substrate.

3. The varactor of claim 2, wherein the first portion of the second conductor has a shape that is one of: rectangular, triangular, and trapezoidal.

4. The varactor of claim 3, wherein the tunable dielectric layer comprises one of:

barium strontium titanate, barium calcium titanate, lead zirconium titanate, lead lanthanum zirconium titanate, lead titanate, barium calcium zirconium titanate, sodium nitrate, $KNbO_3$, $LiNbO_3$, $LiTaO_3$, $PbNb_2O_6$, $PbTa_2O_6$, $KSr(NbO_3)$, $NaBa_2(NbO_3)_5$, KH_2PO_4, and composites thereof.

5. The varactor of claim 4, wherein the substrate comprises one of:

MgO, alumina (AL_2O_3), $LaAlO_3$, sapphire, quartz, silicon, and gallium arsenide.

6. The varactor of claim 5, wherein:

the first portion of the second conductor overlaps a portion of the first conductor.

7. The varactor of claim 3, wherein the tunable dielectric layer comprises a barium strontium titanate (BSTO) composite selected from the group of:

BSTO-MgO, BSTO-$MgAl_2O_4$, BSTO-$CaTiO_3$, BSTO-$MgTiO_3$, BSTO-$MgSrZrTiO_6$, and combinations thereof.

8. The varactor of claim 7, wherein the substrate comprises one of:

MgO, alumina (AL_2O_3), $LaAlO_3$, sapphire, quartz, silicon, and gallium arsenide.

9. The varactor of claim 8, wherein:

the first portion of the second conductor overlaps a portion of the first conductor.

10. The varactor of claim 1, wherein:

the first portion of the second conductor overlaps a portion of the first conductor.

11. The varactor of claim 1, wherein the tunable dielectric layer comprises one of:

barium strontium titanate, barium calcium titanate, lead zirconium titanate, lead lanthanum zirconium titanate, lead titanate, barium calcium zirconium titanate, sodium nitrate, $KNbO_3$, $LiNbO_3$, $LiTaO_3$, $PbNb_2O_6$, $PbTa_2O_6$, $KSr(NbO_3)$, $NaBa_2(NbO_3)_5$, KH_2PO_4, and composites thereof.

12. The varactor of claim 1, wherein the tunable dielectric layer comprises a barium strontium titanate (BSTO) composite selected from the group of:

BSTO-MgO, BSTO-$MgAl_2O_4$, BSTO-$CaTiO_3$, BSTO-$MgTiO_3$, BSTO-$MgSrZrTiO_6$, and combinations thereof.

13. The varactor of claim 1, wherein the substrate comprises one of:

MgO, alumina (AL_2O_3), $LaAlO_3$, sapphire, quartz, silicon, and gallium arsenide.

14. The varactor of claim 1, wherein the first conductor comprises one of:

platinum, platinum-rhodium, and ruthenium oxide.

15. The varactor of claim 14, wherein the second conductor comprises one of:

gold, silver, copper, platinum, and ruthenium oxide.

16. The varactor of claim 1, wherein the second conductor comprises one of:

gold, silver, copper, platinum, and ruthenium oxide.

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